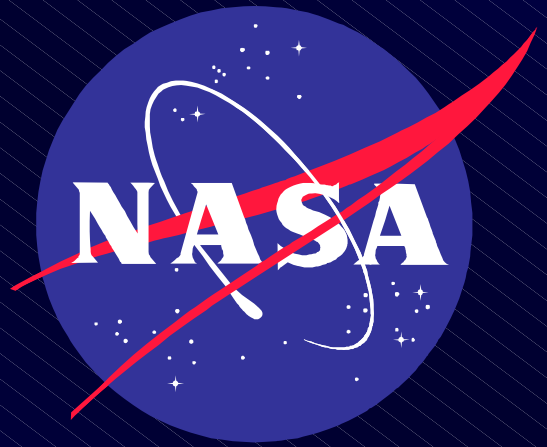
SMCDS Industry Briefing



DSN Operations and Maintenance

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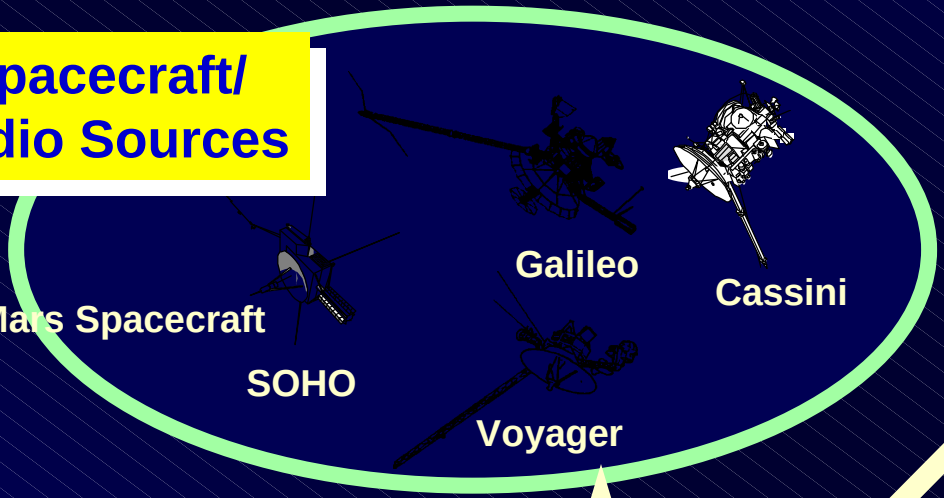
SMCDS Industry Briefing:DSN O&M Topics

- DSN Overview
- SOW Description
- JPL Plans for this Procurement

SMCDS Industry Briefing: DSN O&M

DSN Role in Space Communications

Spacecraft/ Radio Sources



Flight Projects

- Mission Operations

The Deep Space Network (DSN)

- TT&C Services
- Science Observations

Advanced Multi-Mission Operations System (AMMOS)

- GDS Tools
- Mission Services

SMCDS Industry Briefing:DSN O&M

DSN Mission

- Enable NASA's (Space Science Enterprise) interplanetary spacecraft missions and provide services for Earth-orbiting missions that require the special characteristics of the DSN
  - Support on the average more than *40* deep space and Earth-orbiting spacecraft per year
  - Operate *24 x 7* with limited extended downtime
  - Support a large number of Mission critical events during the year
    - Ground support critical to once in a lifetime event. (flyby's)

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DSN Mission (Cont'd)

- Execute ground based radio science experiments
  - Perturbations in the spacecraft radio signal are used to generate science data directly
  - Radio Astronomy
  - Radar
- DSN also provides interagency support
  - Foreign agency spacecraft
- NASA has agreements to get support from other Agencies

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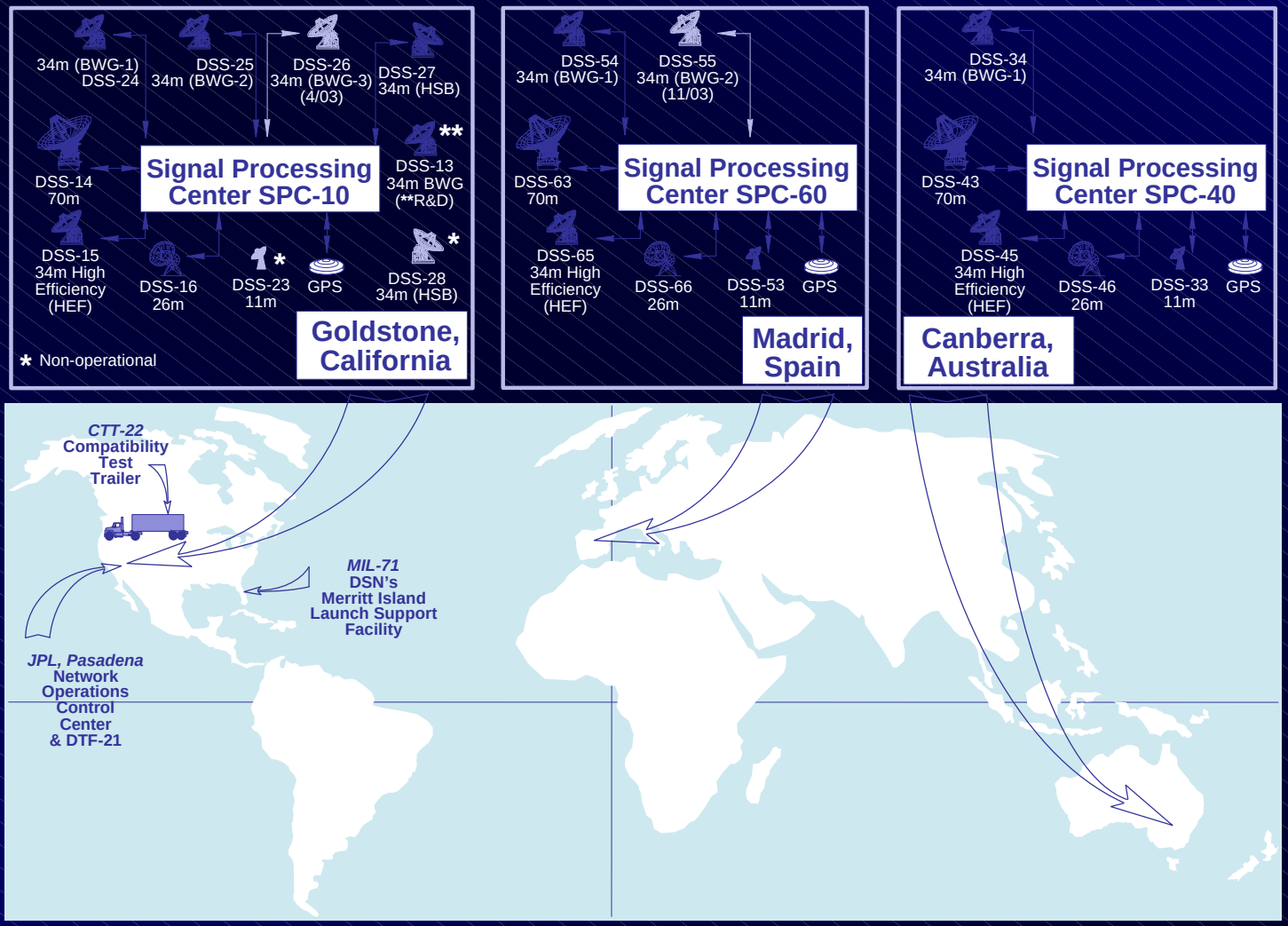
Unique Characteristics of Deep Space Comm.

- Communications performance decreases as the square of the distance.
  - Weak signal - S/C power is low, loss due to distance is large - (It is 500 million times harder (87db) at Jupiter which is 1 billion Km than a Geo satellite which is 40 thousand Km away)
    - Large, precision steer able antennas- capture as much signal as possible and track signal over long periods of time.
      - In the future envision using arrays of 'smaller' antennas
    - Low Noise Amplifiers- cryogenically cooled to 4 Kelvin (Masers)
    - High degree of data compression
  - High Transmitted power – to be acceptable at distant s/c
    - High power transmitters
  - Large signal latencies – critical to capture data first time
    - Highly sophisticated error correcting codes
    - Specialized communication protocols
  - Sophisticated Navigation- There are no maps, we create them

Deep Space Network Resources



SMCDS Industry Briefing:DSN O&M SOW description

- DSN O&M procurement consists of the following elements
  - Goldstone Operations & Maintenance
  - Network Control Center Operations & Maintenance
  - Network Support
  - Sustaining Engineering

SMCDS Industry Briefing:DSN O&M SOW description (Cont'd)

- Goldstone Deep Space Communications Complex (GDSCC)
  - Real-time 24X7 mission support operations
  - Maintenance of the GDSCC facilities and infrastructure
  - Maintenance of the GDSCC operational equipment
  - Maintenance of specific network operational equipment
  - Operation and maintenance of 'advanced systems' at GDSCC
  - Provide technical services needed to support O&M
  - Management of GDSCC including, functions of site security, safety, health & environmental compliance, energy acquisition/conservation, administrative communications, support services and outreach activities

SMCDS Industry Briefing:DSN O&M SOW description (Cont'd)

- Network Control Center O & M (Pasadena)
- Network Support
  - Operate and Maintain DSN test facilities
    - DTF 21 located in Pasadena
    - CTT-22 a mobile test trailer
    - MIL-71 located at the Cape.
  - Allocate and schedule network use
  - Analyze and report on Network performance
  - Support installation, I&T of new S/W & H/W in the network
  - Provide materiel control & shipping to all DSN facilities
- Sustaining Engineering
  - Develop and sustain a designated set of Network subsystem elements

SMCDS Industry Briefing:DSN O&M JPL Plans for this Procurement

- Procurement
  - NASA has granted JPL's request for exclusion from NASA's consolidated solicitation
  - JPL will conduct its own competitive procurement on its own schedule
  - Resulting in the issuance of a JPL subcontract
- Information
  - POC- Clifford Findley – (818) 354-3299, Clifford.E.Findley@jpl.nasa.gov
  - Draft Documents on the Web as they become available
    - http://acquisition.jpl.nasa.gov/rfp/dsno&m
- Tentative Dates
  - Early February - Industry Briefing at JPL, Tour facilities
    - 2 Days in Pasadena (Briefing & Tour), 1 day Goldstone
  - Mid February – RFP release
  - September – Contract Award
  - January 1 2004 – Contract Start